

November, 1972

FROM THE PEN OF

# YELLOW CANARY FEATHERS BY MIKE WOLVJ.



BEFORE I START OUT THIS MONTH I WOULD LIKE TO POINT SOME THING OUT. I WAS PROMISED MATERIAL TO PUT IN THIS MONTH'S ISSUE OF ZERO BEAT, AS YOU CAN SEE I'M LACKING SOME TO FILL THIS ISSUE. EVERY ONE WANTED LOCAL NEWS AND NOT STUFF THAT WOULD APPEAR IN QST EVENTUALLY. WELL, IF IT AIN'T HERE THEN IT WON'T GET PRINTED.

ENOUGH OF THIS BILLY DALLY..... FROM NOW ON THE DEADLINE FOR MATERIAL IS THE END OF THE 2nd WEEK OF EVERY MONTH.

THE OTHER DAY(SUNDAY THE 29th of Oct) (THE DAY AFTER I PICKED UP ED'S 20 METER KIT) I HAD TO SCRAP MY VERTICAL AND BUILD ANOTHER ANT. WELL, BEING NOW I'M HOME I DECIDED TO BUILD A DIPOLE FROM WHAT I HAD. A FRIEND OF OURS CAME OVER AND WANTED TO HELP FINISH IT. I SAID OF COURSE AND SHOWED HIM WHAT I HAD TO DO. (WELL YOU BELIEVE A 1:1 TO 1 SWR?) I PROCEEDED TO LOAD THE KIT UP. IMMEDIATELY AFTER TURNING AROUND FOR A WHILE I HEARD SOMEONE CALLING CQ. I WENT BACK TO THE KIT AND HE STARTED A QSO. IN ABOUT 5 MINUTES THIS TURNED INTO A POPULAR PLACE FOR OVERLOOKING SO LATE. WE BOTH DECIDED TO QUIT AND LET IT GO AT THAT. WHEN I FOUND A CLEAR SWR AND STARTED CALLING CQ. I WAS IMMEDIATELY ANSWERED AND HEARD A QSO. AGAIN THE SAME THING HAPPENED AND WE BOTH DECIDED TO QUIT. THE NEXT DAY I FOUND ANOTHER PERSON CALLING CQ. I WAS LUCKY AND MADE CONTACT THE FIRST CALL. AFTER ABOUT 10 MINUTES HE WENT AWAY, BUT I DECIDED THAT WORTH IT. HE MOVED UP FROM THE KIT AND FOUND A CLEAR SWR. HE MOVED TWO FEET AND WAS FORCED TO QUIT. AT THIS POINT MY FRIEND (WHO BY THE WAY IS A DX-CRUISE) ASKED ME HOW COME I SOUNDED LIKE OH. 20 AND EVERYBODY PALMED OVER EVERYONE ELSE LIKE ON CB. HE ALSO KNOWS THAT THE HAMS HAVE QUITE A FEW HANDS TO OPERATE ON. I COULD NOT THINK OF ANY REASON THAT WOULD EVER COME CLOSE TO EXPLAINING THIS. NOW I HAVE A LETTER FROM SOMEONE WHO I'VE BEEN OFF THE AIR FOR WELL OVER A YEAR, BUT I STILL DID NOT HAVE AN ANSWER. I KNOW THE ONLY REASON FOR THIS IS ONE..... WHAT WOULD YOU CALL A NEW COME IN A SITUATION LIKE THIS, AND BE TELLING THE TRUTH-ESPECIALLY A CERTAIN?

*Mike WolvJ*

#390 September 14.

FCC has now acted in the matter of Docket 19163, regarding the Extra Class license. Effective October 27, 1972, the rules will be amended to provide a waiting period of one year under license, rather than two, as a condition of eligibility to take the extra exam. Present holders of Advanced Class who at one time held the old Amateur Extra First ticket and have been continuously licensed since, will get credit for the 20 wpm code test for the extra exam. Such credit will also be granted holders of certain commercial operator licenses where the code requirement is comparable. Further details will appear in November QST.

\*\*\*\*\*

A genius--is a screwball who makes a crackpot idea work.

MEMO TO ZERO BEAT.

## CONTRIBUTORS

Typed material would be appreciated. This saves the editor time and prevents errors. Your typed material will be edited if space requirements dictate. Please make your material not more than three and one-half inches wide.

Schematics or drawings can also be reproduced by our printer. But, please, make them in ink or very dark pencil. Use a marking type pen if you like.

\*\*\*\*\*

## THYRISTORS

What is a thyristor? It is any semiconductor switch whose bistable action depends on p-n-p-n regenerative feedback. Thyristors can be two, three, or four terminal devices, and both unidirectional and bi-directional devices are available.

The most famous unidirectional thyristor is the SCR, silicon controlled rectifier. Others are SUS, silicon unilateral switch; LASCR, light activated silicon controlled rectifier; CSOR, complementary silicon controlled rectifier; GTO, gate turn-off switch; PUT, programmable unijunction transistor; and the SCS, silicon controlled switch. Shockley diode is a reverse blocking diode thyristor.

Pikes Peak Radio Amateur Association Inc.

Colorado Springs, Colorado

Member

Amateur Radio  
News Service



Permission is granted to reprint articles or excerpts thereof provided full credit is given.

Copy deadline For ZERO BEAT is SECOND WEEK of each month

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2111 Trent Ave. 80909  
635-7554

CHARLES SMITH: DISTRIBUTION  
2611 NORTH FARRAGUT AVE.  
COLORADO SPRINGS, COLO. 80907  
635-7353

The PPRAA meets the second Wednesday of each month  
Security Savings East, East Platte at Union Blvd.

### PRESIDENT'S COLUMN

We had scarcely finished our election at the October meeting when our newly elected President, Bill King submitted his resignation due to unforeseen developments. The PPRAA By-Laws provide that the Vice-President automatically becomes President. I will do my best in this capacity, and with the help of each and every member we can make PPRAA a better club than ever before.

At the November meeting we will hold an election to fill the one vacancy on the Board of Directors, then elect a new Vice-President from the five board members who are not already holding office.

During my tenure as President, I intend to make PPRAA responsive to the interests of its members in the FURTHERANCE OF AMATEUR RADIO. In this light, the theme I intend to pursue is participation by the club members, especially at the monthly meetings. If you're interested enough to come to the meetings, certainly you have something of interest to pass on to other members.

Along this same theme, there is no reason we can't fill ~~o~~ Beat each month with news of local AMATEUR RADIO activities. If you are proud of your particular AMATEUR RADIO activities, tell us why. If you tell others about it, you just may encourage them to try it too.

I anticipate that the monthly club meeting programs will be devoted to radio communications, in particular, AMATEUR RADIO. If you're looking for programs on other subjects, you're in the wrong club.

Hope to see you all at the meeting November 8th. Let's make PPRAA an AMATEUR RADIO club we can all be proud to be members of.

73, Wayne, W2TPV/ø

### CHRISTMAS PARTY

The December meeting is to be at Lott's.

Don't show up at the usual meeting place as the gang won't be there. Instead we will meet at Lott's Fine Food Restaurant, Saturday December 2nd at 1930 South Nevada, for a delicious dinner and entertainment. The cost will be \$2.00 for a fried chicken dinner or \$3.50 for a roast beef dinner. The festivities will start at 6:00 p.m. and the dinner at 7:00 p.m. Please confirm your reservations no later than November 15, by calling Chuck at 632-0743 or Wayne at 635-7096. Come on out for a great evening of entertainment and fun.

Chuck

\*\*\*

at the November meeting we will be voting for one board member and a Vice-President. ~~Be~~ ~~Make~~ Your vote counts!

\*\*\*

Dues for 1973 will soon be due. You can get an application at this month's meeting. Please print clearly or type. Send or give dues and the filled out application to your treasurer "Irvin" Ebel. Dues are: \$2.00 for associate membership and \$3.00 for full membership. Just add \$1 and the whole family is taken care of!

PPRAA DIRECTORY

PRESIDENT	
WAYNE BROWN 2829 SHADY DRIVE 80907 VICE PRESIDENT	W2TPV/ø 598-7096
SECRETARY	
IRVIN K. EBEL 1224 NORTH CUSTER 80903 TREASURER	WØKRV 473-3630
EDITOR	
MICHAEL D. PAYNE 2312 WEST PIKES PEAK AVE. 80904 MEMBERS	WØLWJ/A70XA 471-9362
CHAIRMAN OF THE BOARD	
PETE DEMARIO 1310 KINGSLEY DRIVE 80909	KØUDG 596-3633
EDWARD POMPEA 2111 TRENT AVE. 80909	
KØLPG 635-7554	
JULIAN D. CORNELL 721 LANDING DRIVE 80909	
WØNCT 598-4216	

Remember: when the club asks for money for the Repeater - ~~W~~IV. Just a little from everyone will help lots. And for the people that use ~~W~~IV a five or ten spot would really be appreciated.

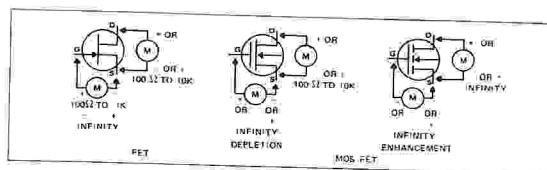
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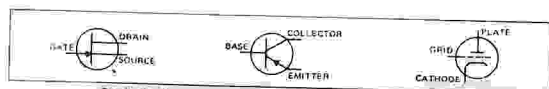
# Circuit News



FET Tests Using an Ohmmeter

Characteristics Comparison of FET's, Transistor, and Vacuum Tube

Characteristic	J FET	MOS FET	Transistor	Tube
Impedance (input) (typical in ohms)	High (10 meg)	Very high (100 meg)	Medium to low (1000Ω)	Very high (100 meg)
Average Life	Long	(Long, see text)	Long	Short
Gate/Base/Grid Current (typical, in amperes)	$1 \times 10^{-9}$	$1 \times 10^{-12}$	$1 \times 10^{-6}$	$1 \times 10^{-9}$
Noise (internal)	Low	Low (variable)	Medium to low	Low
Amplification Factor	Low	Low	Low to high	Low to high



Symbolic Comparison of FET, Bipolar Transistor, and Vacuum Tube

## SAD NEWS

Mrs. Bernice Mintz, wife of Max Mintz, of D & M Electronics Supply, passed away November 2. She was active in the operation of the business for the past 20 years. Local amateurs always received a cheery smile from her.. Services were held at Swan Funeral Home Nov. 3. We all extend our condolences to Max.

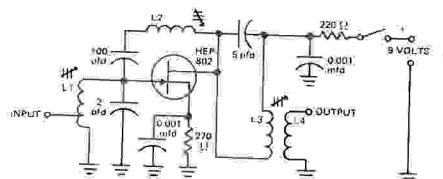
## 2-METER (150 MHz) PREAMPLIFIER

### USES:

Provides Low-Noise Amplification Ahead of Receiver

### FEATURES:

Provides 14dB Gain at Low Noise



### PARTS LIST:

- 1 HEP 802
- 1 Ceramic Capacitor, 0.001 mfd, 10V
- 1 Mica Capacitor, 2 pfd, 10V
- 1 Mica Capacitor, 5 pfd, 10V
- 1 Mica Capacitor, 100 pfd, 10V
- 1 Resistor, 220 Ω, 1/2 Watt, ± 10%
- 1 Resistor, 270 Ω, 1/2 Watt, ± 10%
- 1 SPST Switch
- 1 9 Volt Battery

(All coils wound on brass-rod ceramic form)  
L1 5 1/4 turns, tapped at 1 1/4 turn, #26  
L2 5 1/2 turns, #26  
L3 5 turns, #26  
L4 1 1/4 turn, #26, at low end of L3

NOTE: All leads should be kept as short as possible (pc board is recommended)

## EMERY STUDIO

## PORTRAITS — COMMERCIAL PICTURE FRAMING

DON EMERY W0DYU

1 Block W. of Academy Blvd. between  
Palmer Park Blvd. & Constitution Ave.

3730 E. La Salle Telephone 597-0026

## BROADBAND RF AMPLIFIER

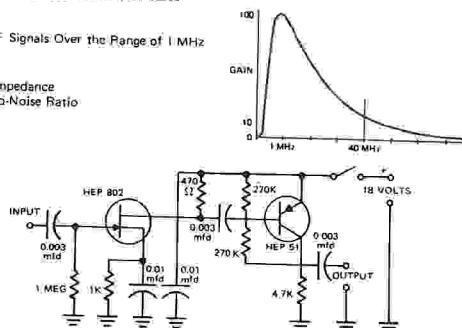
### USES:

Amplifies RF Signals Over the Range of 1 MHz

to 40 MHz

### FEATURES:

High Input Impedance  
High Signal-to-Noise Ratio



### PARTS LIST:

- 1 HEP 802
- 1 HEP 51
- 1 Resistor, 1 meg, 1/2 Watt, ± 10%
- 1 Resistor, 1K, 1/2 Watt, ± 10%
- 1 Resistor, 4.7K, 1/2 Watt, ± 10%
- 1 Resistor, 470 Ω, 1/2 Watt, ± 10%
- 2 Resistors, 270K, 1/2 Watt, ± 10%
- 2 Ceramic Capacitors, 0.01 mfd, 25V
- 3 Ceramic Capacitors, 0.003 mfd, 25V
- 1 SPST Switch
- 2 9 Volt Batteries

# DX

DX originally meant distant, or distance, for those early radio pioneers who wanted to work outside their immediate locale. As equipment improved, and more was learned about this strange hobby of ours, the meaning was gradually changed to mean outside the state, country, and eventually, outside the continent. Today the general interpretation of DX, as applied to the HF bands, means outside the country. Avid U.S. DXers generally mean outside the North American Continent.

There are approximately 325 countries as defined by the ARRL DX Committee. Although there are only some 156 independent countries in the world, ARRL applies many criteria to define and increase the country list so those of us who enjoy this phase of the hobby always have a "new" country looming in the future. Some of the criteria are: geographical separation by foreign land, separation by water and by government administration. Interestingly enough, ARRL refuses to recognize East Germany or Berlin as falling into any of these areas.

ing various totals and/or combinations of countries. ARRL awards the DXCC for 100 countries worked and confirmed. While DXCC was difficult to obtain at one time, today it is possible to work over 100 countries during a single weekend...hence the competition to push your total towards 325.

The International Short Wave League offers the Century Club Award and the Radio Club of Argentina applies a slight variation by requiring 101 confirmations to win the 101 Award.

Probably the most coveted DX award is the Worked All Zones, or WAZ, offered by CQ Magazine. Rather than rely on rather nebulous boundaries, they divided the world into 40 zones and confirmations from all 40 are required to win the WAZ. Your writer was fortunate in getting WAZ #1393 in 1960. Next month I hope to discuss some of the methods and procedures used to work not only the more common countries, but how to go after those elusive "rare" ones.

Since this is our first column, we are working with a limited input for who is working what from the Pike's Peak area. Please

notify me as to what you are working, and when, so it may be included in future columns.

Wayne, W2TPV/Ø has been working numerous JA stations on 21 mhz SSB. Russ, WBØGKF, worked F8RU and HB9AJI on 21cw, using a Ranger and a dipole only 10 inches above the roof. Since those are my only inputs, I must rely on my own log to demonstrate some of the DX that was being heard in this area during October.

14mhz 0200-0400Z

CR7BN, ZS1FF, ZS5KI, UK9KAD, UL7CT, UAØSP, CE3CB and CP5BC.

21mhz 1400-1700Z

HA5KKB, OH2RL, YU2ACD, OK3DG, UK1 AAG, F8RU, DK6ML, I1PZ, EA2IA, ON4 AW, GI3YFY, SM3AT, LZ1KEZ and PAØCWS.

21mhz 2300-0200Z

HM5EE, VK2EG, PY3CBX, VK6HD and JAs all over the place.

28 MHZ

FGØAMC/ES7----1500Z, PZ5CW--1510, CR6AD---1845 and ZL3AB---2200.

As you can see, more reports are needed from you DXers. Mail them to me at 1927 Wynkoop Drive, 80909 or phone them in at 596-1912 during the evening.

73, Dale, WØLDV

## FOR SALE

HALLICRAFTERS SR-400 XCVR---400 WATTS  
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HALLICRAFTERS MOBILE MOUNT, HUSTLER  
MOBILE ANTENNA & COILS FOR 15-20-40  
PACKAGE \$695. WILL CONSIDER SEPARATE  
DALE, WØLDV, 596-1912

## NOVEMBER 8 MEETING

Dale Green, WØLDV, will be our speaker on Nov. 8. He has promised an amusing and informative program entitled, "COMMUNICATIONS FOR LADY GODIVA".



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· teac

**see dan - waøkxo**

# TOM'S MICROWAVE CORNER

CONDUCTED BY TOM SEGRAVES  
UN69AR

## PROPAGATION AT MCRW FREQS

### PART 3: COMMUNICATION LIMITATIONS

THE ATMOSPHERE AND/OR POOR PLANNING IN THE INSTALLATION OF MCRW SYSTEMS CAN SPELL THE DOOM OF ESTABLISHING COMMUNICATIONS. THIS IS MALTOPIC FOR THE COMPLETION OF PROPAGATION. I WILL POINT OUT SOME OF THE CONDITIONS THAT EFFECT MCRW IN THE ATMOSPHERE AND A FEW AREAS TO WATCH FOR IF YOU EVER DECIDE TO PLAY AROUND WITH MCRW. RADIO WAVES WILL TRAVEL, IN A VACUUM, ALARLY 196,000 MILES PER SECOND, OR IF YOU PREFER 330 YARDS IN A MICROSECOND. I. ALMOST ANY OTHER MEDIUM, HOWEVER, LIGHT VELOCITY WILL BE SLOWER THAN THAT OF A VACUUM. ALSO SIGNALS OF DIFFERENT FREQUENCIES HAVE DIFFERENT VELOCITIES BOTH IN AND OUT OF A VACUUM.

I WILL BE USING A UNIT CALLED INDEX OF REFRACTION. THIS IS A NUMBER, USUALLY A FRACTION, THAT IS DIVIDED INTO TWO SPEEDS OF THE RADIO WAVE IN A VACUUM. USUALLY 1/196,000 MILES PER SECOND, WHERE N IS THE INDEX OF REFRACTION. THE INDEX OF REFRACTION IS USED TO FIND THE SPEED OF A RADIO WAVE IN ANY MEDIUM EXCEPT THAT OF A VACUUM SINCE IT'S 1.0. OK? HOPE IT'S CLEAR.

A MCRW SIGNALS IN AIR BECOMES SMALLER WITH DECREASING PRESSURE AND MOISTURE CORRELAT BUT LARGER WITH DECREASING TEMPERATURE. SO IN A NORMAL ATMOSPHERE, THE HIGHER IN ALTITUDE YOU GO THE SMALLER WILL BECOME EACH OF THE VARIABLES JUST NAMED. THE RESULT, UNDER NORMAL CONDITIONS, IS THAT MCRW SIGNALS DECREASES UNIFORMLY WITH HEIGHT UP TO APPROX. 20,000 TO 25,000 FEET. WITH THE INCREASE OF HEIGHT ANOTHER SITUATION EXISTS. THE PATHS FOLLOWED BY MCRW SIGNALS ARE ALMOST ALWAYS CURVED.

THE SPEED AT WHICH A MCRW SIGNAL TRAVELS THROUGH THE ATMOSPHERE DEPENDS ON THE THREE VARIABLES. USUALLY THE HIGHER THE TEMPERATURE THE FASTER THE SIGNAL. SAME WITH LOWERING THE WATER CONTENT AND THE ATMOSPHERIC PRESSURE. SO WHAT HAPPENS WITH AN INCREASE IN ALTITUDE? AN INCREASE IN THE SPEED OF THE SIGNAL.

NOT BECAUSE THE SPEED OF A SIGNAL INCREASES WITH AN INCREASE OF ALTITUDE THE MCRW SIGNAL WILL HAVE A TENDENCY TO CURVE IN A DOWNWARD DIRECTION. I'LL CALL THIS A LITTLE CLEARER. LET US TAKE A WAVE FRONT SO THAT THE PHASE OF THE SIGNAL IS THE SAME ACROSS THE WAVE FRONT. AS THE WAVE TRAVELS ALONG THE TOP WILL BE GOING FASTER THAN THE BOTTOM. BECAUSE IT'S HIGHER IN ALTITUDE. THIS WILL CAUSE THE WAVE TO TIP DOWN JUST A LITTLE BIT AS IT TRAVELS ALONG.

RADIO WAVES ARE ALSO BENT WHEN THEY

PASS FROM ONE MEDIUM TO ANOTHER MEDIUM THAT HAS A DIFFERENT DENSITY. BECAUSE WAVES ARE BENT FROM LOWER DENSITY MEDIUM INTO A HIGHER ONE OUR ATMOSPHERE CAN CAUSE RADIO WAVES TO BE BENT AROUND THE EARTH. NOW A CURVED PATH LIKE THIS IS CALLED A DUCT. STRANGE AS IT MAY SEEM TO SOME OF YOU, THE GREATER WILL BE YOUR CHANCES OF GETTING INTO A DUCT WHICH WILL GIVE YOU ABNORMAL PROPAGATION EFFECTS.

THE THREE VARIABLES HAVE A HAND IN CAUSING THESE DUCTS THAT I HAVE MENTIONED. UNDER NORMAL CONDITIONS WHERE TEMP. AND MOISTURE DECREASE UNIFORMLY WITH ALTITUDE DUCTS CANNOT BE FORMED; HOWEVER WHEN A GREAT VARIATION OF MOISTURE AND TEMP. INVERSION EXIST TOGETHER THEN A DUCT IS LIKELY TO EXIST, TOO.

THERE ARE TWO OTHER PROBLEMS THAT THE ATMOSPHERE PRESENTS TO MCRW AND THEY ARE 1. SCATTERING THE MCRW SIGNALS OR 2. THE ABSORPTION OF THEM.

CONT. PAGE 6

## EVERYTHING IN REAL ESTATE

### HOMES LAND RANCHES SALES and RENTALS

ED POMPEA  
635-7554

BILL KING  
634-4751



596-8200  
3803 PALMER PARK BLVD.  
(NEAR THE RUSTIC HILLS SHOPPING CENTER)

[illegible]

THE CONCLUSIONS REACHED ARE AS  
FOLLOWS: THAT JOHN LEE GALT IS  
STILL IN THE ATLANTA AND NEARBY  
AND TWO BUILDINGS, ON GALT BLVD.  
- IN THE CITY OF ATLANTA, AND THAT HE HAS BEEN A  
RECENTLY.

說明：該校不另收學費、雜費。

Announcement is hereby made of two actions taken concerning the DXCC. Effective October 1, the Maria Theresa listing is removed from the Countries List and all credits which have been given will be annulled. Also effective October 1, Minerva Reefs will become a deleted country and only contacts made prior to July 15, 1972 will be creditable towards this listing. The Kingdom of Tonga has annexed Minerva Reef. Because Minerva is less than 500 miles from Tonga, it no longer meets the criteria for separate status. These actions are in accord with recommendations made by the ARRL DX Advisory Committee. Full details appear on page 106 of September QST.

Two new editions of popular ARRL directories are now available for distribution. The current revision of the Repeater Directory, detailing 615 repeaters, requires an addressed envelope larger than 6 by 9 inches, with 24 cents postage for first class mailing. The 1972 Net Directory can be sent first class in an addressed legal size envelope with 16 cents return postage. For both directories, send the larger envelope with 32 cents postage. Directories have been mailed to those filing earlier requests.

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# ROSIE'S REPORTINGS

Rosemarie Lewis

WAØMNL

## COMMITTEES APPOINTED

### NOMINATING COMMITTEE

Don Emery - WØDYE - Chairman

To choose 2 more members to assist him

### 2 - METER FM COMMITTEE

Glyde Still

Pete and Ida Demario - KØUDG - WAØMNL

Bob Sayers - WØDFA

David Givan - KØLLE

George Kowalski - WØDCE

Oak Stockton - KØROL - also acting representative to CCARC

### 2 - AREA AL COMMITTEE

"Doc" Cornell - WØDCE

Irv Ebel - WØKIV

### SEARCH AND RESCUE - El Paso County

George Kowalski - WØDCE

### SCOUT ASSISTANT - EMERGENCY

Bob Sayers - coordinator - WØDFA

### RACES

Dean Jaynes - WAØPJE - Radio Officer

Ldon Lewis - assistant Radio Officer WAØMNL

### RAILS

Pete Demario - KØUDG

### TECHNICAL INSTRUCTION COMMITTEE

John Summers Sr. - WAØMNL  
Charles Myers - WAØZCS  
Elmer Schladweiler - WAØWY  
Will Gordon - WØDCE

### HISTORIANS

Jim Reynolds - WØDME

"Doc" Cornell - WØDCE

Gene Bacon - WØCKY

### AUCTION COMMITTEE

Pete Demario - KØUDG

Bill Haskins - KØCEN

Oak Stockton - KØROL

Ida Demario - WAØMNL

### AUDITING COMMITTEE

Bill Haskins - KØCEN

Art Mayer - WAØASH

### INTERFERENCE COMMITTEE

James Don Carlos - WØITU - chairman

To chose 2members to assist

### YL COMMITTEE

Shen Allison - WØDY/Ø

Ida Demario - WAØMNL

Linda Vidmar - WØDCE

### SCOOP COMMITTEE (SUPPORTING LEVEL OF OPERATORS)

Iris Summers

Ida Demario

Alene Green

Liz Don Carlos

Shirley Kowalski

### COOPERATION COMMITTEE

"Clarty" Brown - WØDCE/Ø

Ida Demario - WAØMNL

Irene Koppea - WØDCE

Woss Ebel

James Don Carlos - WØITU

Dean Jaynes - WAØPJE

Dale Green - WØLDV

Irv Ebel - WØKIV

Maury Wunderlich - WAØYNE

Harlan Park - WAØYVS

Chuck Lucas Jr. - WAØAWN

Fred Palmblad - WØCYM

### WIS

Wayne Brown - WØDCE/Ø

Mike Stansbury - WØDCE

### CONTEST COMMITTEE

Dale Green - WØLDV

Wayne Brown - WØDCE/Ø

### Ø TEAM

Mike Payne - WØDCE/Ø

Ed Koppea - WØDCE

Wanda Payne - typist

### CCARC

Charles Myers - WAØZCS

Oak Stockton - KØROL

### FIELD WIF

"Doc" Cornell - WØDCE

### AREA VICE DIRECTOR FOR PARK

"Irv" Ebel - WØKIV



## CW ELECTRONICS SALES COMPANY

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SIGNAL/CW

John WAØADV  
Mike WAØKXR

Carey WAØECS  
Gary WAØKLP

John WØFU

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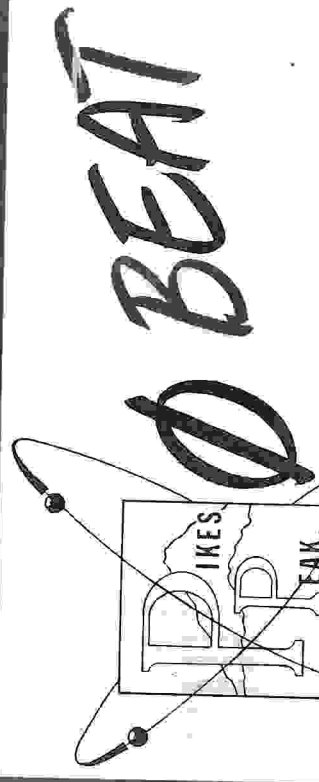
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93 each*

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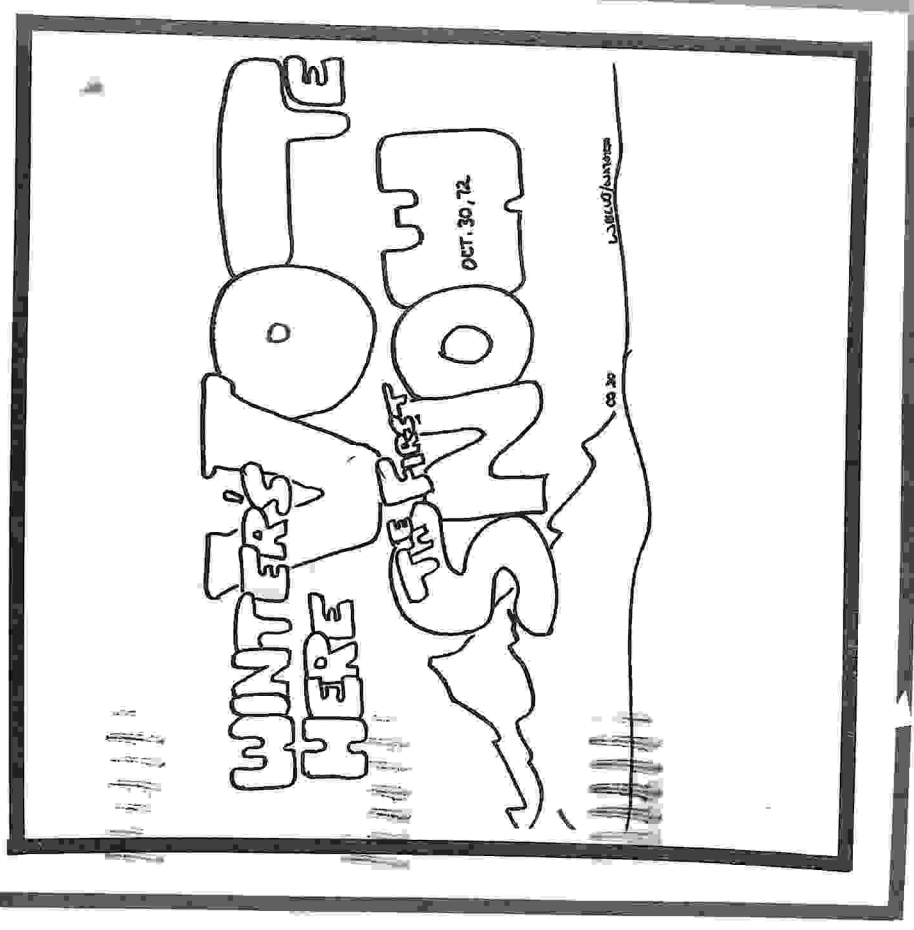
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